

Sales Expert Boosts Florida Citrus

In a recent statement before the Florida Citrus Commission in Lakeland, Bill Atcheson, veteran director of the fruit and produce division of the huge Kroger grocery chain of 3000 stores in seventeen mid-western states, declared that the Florida citrus industry for the past two or three years has been doing a "mighty good job of advertising and sales promotion," but that Florida growers and shippers "must find a way to get their fruit to market in fresher condition."

Atcheson, conferring with the advertising committee of the Florida Citrus Commission, said the average housewife today is "demanding freshness and quality, and is not paying much attention to the price so long as she gets what she wants. After all, it is the consumer who keeps us in business and makes it possible for our chain and other retail outlets to buy your fruit—its the ultimate consumer who rings the cash register all down the line."

Declaring "we like Florida citrus better than that from other areas" Atcheson said the citrus industry has been doing a "bang up" job of advertising and sales promotional work—so much so that housewives are now asking for "Florida oranges with more juice." This sales effort, he believed, could be made more effective by increasing the per box retain for advertising purposes.

"Brand names mean nothing" in Florida citrus merchandising, he said, declaring that the name "Florida" stamped on individual fruit would have prestige and would do a job comparable to that of "Sunkist" used by California. "Florida oranges mean a lot to the consumer today because she has been taught that they contain up to one-fourth more juice, and that is what she wants in oranges."

Consumer and market research should be used, he said, to determine the desires of the housewife in buying not only oranges but all citrus fruits, "and then you should strive to give her what she wants—because she is the one to whom you cater."

"But above all, Florida needs ways and means of getting the fruit to the consumer more rapidly, to make sure that it is in prime, fresh condition when she gets it in the market.

You already have a definite 'plus' in your marketing by being closer to the consumer areas than California, and you should expand that advantage to the fullest."

The trend in packaging of all fresh fruits and vegetables is to consumer units, Mr. Atcheson said, and thus pound selling fits into the picture as a merchandising asset. Admitting that the packaging of consumer units, such as the eight-pound cotton mesh bag which has been extremely popular this season, consumes a lot of time, he said he is looking for the development of a small unit which will do this packaging at the point of sale or in the packing house, speedily and economically.

Commenting on the anticipated increased production of Florida oranges in the future, with a crop of something like 65,000,000 boxes estimated in five years, he said that increased advertising funds, properly spent, coupled with sales promotion and the proper consumer and market research to determine what the buyer wants, "will handle your problem." An increased advertising tax, as projected by some circles in the industry, is "mighty good business," he said.

This review of the citrus situation in Florida by an outsider, but one who is intimately and vitally concerned with citrus marketing, should be of interest to every citrus grower and shipper in the state. His statement that consumers prefer Florida oranges to those produced in other areas is, naturally, gratifying to Florida growers, but that does not mean that we should overlook his suggestion that we need to put forth additional effort to expand the sale and consumption of our fruit. In the post-war period, with Federal purchases withdrawn or severely curtailed, with ever increasing production and even more active competition, Florida growers will need to take advantage of every possible avenue for the expansion of markets.

Mr. Atcheson's emphasis on freshness, quality and speedy delivery are points well taken and should be given careful consideration by Florida growers. It is well at times to get an outsider's point of view, especially when the outsider is in position to speak with authority, as seems to be the case in this instance. Florida growers will do well to seriously ponder the points brought out by this sales promoter who is evidently well disposed toward Florida citrus fruits.

CITRUS TREES

ARE SCARCE

We are doing the best we can, with the shortage of labor, but the demand for LAKE GARFIELD TREES has been at least three times as great as the supply this season. We are sold out of trees ready now and probably all that will be for planting this summer.

MORE READY NEXT SEASON

Budding will begin about April 1st, and we can now accept tentative orders on a limited basis for delivery during the spring of 1946. By placing a tentative order now you will have a certain amount of priority, and this summer we will estimate the number of trees we will have and divide them up the best we can, at which time definite orders will be made and confirmed.

Lake Garfield Nurseries Co.
BARTOW, FLORIDA



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Summary Of Citrus Costs And Returns --Crops Marketed 1931-32 Through 1941-42

The kind of management given a citrus grove very materially affects the cost of producing fruit and the net returns from it. Cost and return records greatly facilitate organization and management for the most continuous profit. While it is true that each grove has its own peculiarities and no one program can be followed to the best advantage on all groves, yet averages obtained from a large number of groves indicate average practices and serve as a check or guide for an individual grower in studying his own problems. The citrus records kept by growers since 1931-32 in cooperation with the Florida Agricultural Extension Service have supplied the individual grower with detailed recorded information to which he can refer at any time and the summaries made by the Agricultural Extension Service have shown the grower the average practices of all cooperating growers.

Such records and summaries supply the needed information for adjusting or changing the controllable factors for greater and more continuous profits from citrus. These records also assist in determining those practices that lessen the adverse effects of factors beyond the control of operators, such as rainfall and temperature.

ZACH SAVAGE

Extension Agricultural Economist

Average Grove Costs and Returns

Average costs and returns for the 11-year-period, 1931-32 through 1941-42, for groves averaging over 10 years of age are shown in Table I. Total operating costs per acre fluctuated very little from season to season, except for the first season of this period, which was 44 percent higher than the average for the period. There were wider fluctuations in the number of boxes of fruit harvested and in the returns per box of fruit, which resulted in fluctuations in the returns per acre of 53 percent below the average for the period of 1932-33 season to 80 percent above the average for the period in 1941-42.

These groves failed to return 6 percent on their estimated valuation during five of the eleven seasons. The net return above operating costs was a minus quantity during one season only, 1932-33.

Costs and returns by average age groupings are shown in Table II. The cost of labor, power, and equipment for the 11 to 14-year group

was less than for the younger group of 10 years and under. This may be accounted for by all the land area not occupied by the spread of the trees being covered in the cultural operations which would mean more land area covered in the younger groves, thus requiring more time and cost per acre of grove. The cost of labor, power and equipment per acre for the group 10 years and under exceeded this cost for the 11 to 14-year group in 7 of the 11 seasons.

There was one season, 1932-33, when fruit returns in the three younger groupings did not equal operating costs. The oldest grouping paid operating costs each season.

Cost of Labor, Power and Equipment

The cost of labor, power, and equipment for groves averaging 10 years of age and under and for groves averaging over 10 years of age is shown in Table III. These data are on groves cared for by commercial caretakers and cooperative production associations, since the cost of power and equipment could not be separated by operations on owner-operator groves.

Mowing was the only cultural operation that cost more per acre for groves averaging 10 years and un-

der than for groves averaging over 10 years of age. In operations like disking and harrowing in young groves there is often a strip between the rows that is left uncultivated which makes such operations cost less than would be the case if the entire middle were cultivated. Pruning and spraying and dusting costs are more nearly proportional to the size of the trees.

Cultivation costs per acre decreased during the 11-year period. Such cost averaged \$6.69 per acre for the first three years of this period on groves averaging over 10 years of age and decreased to \$3.82 during the last three years, which was a reduction of 43 percent. The operation of mowing which included rotary cutting increased slightly during the 11-year period. Spraying and dusting costs per acre increased during the period, increases being 17.5 percent between the first and last three-year periods of this study on groves of an average age of over 10 years. Other grove operation costs varied from year to year but showed no significant trends during the period.

Costs and Returns From Orange Groves

The average costs of producing oranges and returns per acre and per box are shown in Table IV. The average age of each of these groves exceeded 10 years.

The fruit harvested for the 11-year period averaged 180 boxes per

acre. In 1933-34, 104 boxes were harvested per acre and 252 boxes in 1938-39, which were the low and high seasons in boxes harvested.

Average returns for each season exceeded operating costs for the corresponding season. Returns were sufficient to pay the operating costs

The average annual cost of fertilizer and amendments per acre was \$8.25 higher for grapefruit than for orange groves. This variation in cost accounts for the difference in the total operating costs per acre between the two kinds of groves.

The returns per acre from fruit averaged \$156.11 for orange and

TABLE 1. Average Annual Costs and Returns for Citrus Groves Averaging Over 10 Years of Age.

Crops Marketed 1931-32 Through 1941-42, With Supplementary Data

Number of records	2386	
Average acres per grove	32	
Average age of all groves	19	
Number of trees per acre	60	
Percent trees grapefruit	32	
Boxes harvested per acre	154	
Costs:		
Labor, power, and equipment	\$ 23.25	\$.151
Fertilizer and amendments	23.04	.150
Spray and dust material	4.22	.027
Taxes (State and County)	5.53	.036
Miscellaneous	1.80	.012
Total operating costs	57.84	.376
Interest on grove at 6%	33.17	.215
Total costs excluding owner's supervision	91.01	.591
Returns from fruit	105.79	.687
Net returns	14.78	.096
Net returns above operating costs	47.95	.311
Percent return on valuation of \$553 per acre	8.7	

and 6 percent on the estimated grove investment during each season except 1932-33.

Costs and Returns From Grapefruit Groves

The average costs of producing grapefruit and returns per acre and per box are shown in Table V.

\$118.69 for grapefruit groves, 32 percent more for oranges. The boxes of fruit harvested per acre averaged 54 percent more for grapefruit, while the returns per box of fruit averaged 103 percent higher for oranges. The range in fruit
(Continued on page 8)

TABLE 2. Relationship of Average Age to Costs and Returns for Florida Citrus Groves
Crops Marketed 1931-32 through 1941-42

	Average Age of Groves (Years)							
	10 & Under		11 to 14		15 to 19		20 & Over	
Number of records	467		626		863		894	
Average acres per grove	36		47		32		19	
Average age	8		13		17		26	
Percent trees grapefruit	29		27		37		26	
Boxes harvested per acre	93		116		163		216	
Costs:								
Labor, power, and equipment	\$ 21.16	\$.227	\$ 19.51	\$.168	\$ 24.62	\$.151	\$ 29.93	\$.139
Fertilizer and amendments	16.57	.178	19.89	.171	25.37	.155	29.32	.136
Spray and dust	3.20	.034	3.58	.031	4.50	.028	5.15	.024
Taxes (State & County)	3.52	.039	4.47	.039	5.64	.035	7.86	.036
Miscellaneous	1.71	.018	1.33	.011	1.54	.009	2.84	.013
Total operating costs	46.16	.496	48.78	.420	61.67	.378	75.10	.348
Interest on grove valuation at 6%	25.94	.279	27.50	.237	34.10	.209	40.17	.186
Total costs excluding owner's supervision	72.10	.775	76.28	.657	95.77	.587	115.27	.534
Returns from fruit	71.41	.768	81.83	.705	105.97	.650	156.92	.726
Net returns	— .69	— .007	5.55	.048	10.20	.063	41.65	.192
Net returns above operating costs	25.25	.272	33.05	.285	44.30	.272	81.82	.378
Estimated grove valuation per acre	\$432		\$458		\$568		\$670	
Percent return on grove valuation	5.8		7.2		7.8		12.2	
Number of seasons when fruit returns did not equal total cost excluding owner's supervision	7		6		5		3	

Canned Citrus Juice Set Aside Under WFO 22.7 Increased

The War Food Administration has increased the quantity of canned citrus juice required to be set aside (under WFO 22.7) from the current pack, and announced that individual canners who have contracted with the government for delivery of the required quantity may file application for release from the provisions of the emergency order — WFO 122 — issued in January, it was announced by M. F. Miller, field representative of the WFA.

The new set aside percentages under WFO 22.7 based on last year's pack, are as follows:

Grapefruit juice 41 percent — increased from 39; orange juice 58 percent — increased from 30; blended juice (orange and grapefruit) 49 percent — increased from 32.

WFO 122 prohibits the sales, shipment or deliveries of canned citrus juices produced in Florida, and Texas, except to armed forces. When an individual canner, however, has contracted with the government for the required quantity under WFO 22.7, he may file an application with the Order Administrator, WFO 122, War Food Administration, Washington, D. C., for release from provisions of WFO 122. Since the emergency was issued in January civilian supplies have been withdrawn from stocks in consumer outlets.

Measured in terms of the current (1944-45 season) estimated packs, the new set aside percents under WFO 22.7 will be 51 percent (10.8 million cases) for grapefruit juice; 45 percent (4.5 million cases) for orange juice; 43 percent (3 million cases) for blended juice. Estimated total 1944-45 packs are: 21 million cases of grapefruit juice, ten million cases of orange juice, 7 million cases of blended juice. This compared with 26.3 million, 8 million and 6.2 million respectively last year.

The only other change in WFO 22.7 by the current amendment to

the order designates a new base period and set aside percent for grapefruit segments. The entire production being set aside for the military needs. The original order required 58 percent set aside based

on 1941-42 pack, and the amended order requires 100 percent based on current (1944-45) pack. Since production this year will not meet even the military requirements, none will be available for civilians.

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*Buy 'em and
Keep 'em* **WAR
BONDS**

SUMMARY OF CITRUS COSTS AND RETURNS (Continued from page 6)

harvested per acre of grapefruit groves was from 116 boxes in 1933-34 to 416 boxes in 1940-41.

Returns per acre above operating costs were \$86.61 for orange and \$41.43 for grapefruit groves, or 109 percent higher for oranges. On a per box basis these net returns were 48 cents for oranges and 15 cents for grapefruit.

The net returns per acre after paying operating costs and 6 percent interest on estimated grove investment were \$50.16 for orange and \$9.96 for grapefruit groves. There were two seasons during this 11-year period when grapefruit groves failed to pay operating costs, and six seasons when they failed to pay operating costs and 6 percent interest on the estimated grove investment. On a per box basis net returns to the owner for his supervision were 27.9 cents from orange

and 3.6 cents from grapefruit groves. \$608 per acre, grapefruit groves \$524. Returns on these valuations averaged 14.2 and 7.9 percent, respectively.

TABLE 3. Labor, Power, and Equipment by Operations; Average Annual Cost Per Acre and Per Box for Groves Averaging 10 Years of Age and Under and for Groves Averaging Over 10 Years. Crops Marketed 1931-32 through 1941-42

ITEM	Average Age of Groves	
	10 Years & Under	Over 10 Years
Number of groves	234	1541
Average acres per grove	19	16
Average age	8	19
Percent trees grapefruit	26	26
Boxes harvested per acre	97	185
	Per Acre	Per Box
Labor, power, & equipment		
Cultivation	\$ 4.88	\$.051
Fertilization	2.19	.023
Spraying and dusting	3.69	.038
Pruning	2.37	.024
Mowing	1.34	.014
Miscellaneous	2.29	.024
Total	16.76	.174
	Per Acre	Per Box
Labor, power, & equipment	\$ 5.02	\$.027
Cultivation	2.41	.013
Fertilization	6.44	.035
Spraying and dusting	4.59	.025
Pruning	.72	.004
Mowing	2.75	.015
Miscellaneous		
Total	21.93	.119

TABLE 4. Average Costs and Returns for 516 Orange Grove Records, Groves Averaging Over 10 Years of Age. Crops Marketed 1931-32 Through 1941-42

Total acres of groves	9947
Average acres per grove	19
Average age	19
Number of trees per acre	63
Percent trees grapefruit	2
Boxes harvested per acre	180
Costs:	Per Acre Per Box
Labor, power, and equipment	\$ 27.85 \$.155
Fertilizer and amendments	26.64 .148
Spray and dust material	4.68 .026
Taxes (State and County)	6.56 .036
Miscellaneous	3.77 .021
Total operating costs	69.50 .386
Interest on grove valuation at 6%	36.45 .202
Total costs excluding owner's supervision	105.95 .588
Returns from fruit	156.11 .867
Net returns	50.16 .279
Net returns above operating cost	86.61 .481
Percent return on valuation of \$608 per acre	14.2

TABLE 5. Average Costs and Returns for 122 Grapefruit Grove Records, Groves Averaging Over 10 Years of Age, Crops Marketed 1931-32 Through 1941-42.

Total acres of groves	2194
Average acres per grove	17
Average age	19
Number trees per acre	61
Percent trees oranges	7
Boxes harvested per acre	277
Costs:	Per Acre Per Box
Labor, power, and equipment	\$ 27.91 \$.101
Fertilizer and amendments	34.89 .126
Spray and dust material	6.83 .025
Taxes (State and County)	6.09 .022
Miscellaneous	1.54 .005
Total operating costs	77.26 .279
Interest on grove valuation at 6 %	31.47 .113
Total costs excluding owner's supervision	108.73 .392
Returns from fruit	118.69 .428
Net returns	9.96 .036
Net returns above operating cost	41.43 .149
Percent return on valuation of \$524 per acre	7.9

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E. W. Yandre, President
Orlando, Florida

Federal Land Bank Owns No Farms

The Federal Land Bank of Columbia, serving North Carolina, South Carolina, Georgia and Florida, did not own a single farm at the close of business December 31, 1944, Julian H. Scarborough, president, announced recently.

"This is an excellent tribute to the officers and directors of the 87 national farm loan associations in our district who handle the sale of farms acquired by the bank through foreclosures.

"Due to their efforts many foreclosures have been avoided but when it finally becomes necessary to take over a farm they see that it is sold without delay to the best advantage; thus, for the second time in two years the books of the Federal Land Bank and the Federal Farm Mortgage Corporation have been cleared of real estate," Mr. Scarborough said.

"Ours was the first of the 12 federal land banks in the system to reach the goal of 'no real estate owned' when on June 30, 1943, all farms owned as of that date had been sold," he added.

Farmers in the states of North Carolina, South Carolina, Georgia, and Florida borrowed over 82½ million dollars from the Farm Credit Administration of Columbia in 1944, Harry L. Brown, general agent, has announced.

Of the total amount the Federal Land Bank through the 87 national farm loan associations in the district loaned \$10,305,000 in long-term farm mortgage loans. Short-term operating loans through 92 production credit associations and the Federal Intermediate Credit Bank amounted to \$37,719,000. The Columbia Bank for Cooperatives made loans totalling \$34,632,000 to farmers' cooperative marketing and purchasing associations.

Applications received by the Federal Land Bank during 1944 totalled 4,581 — about 1600 more than the previous year. The production credit associations made 37,199 short-term loans during the same period.

Many fruit and nut trees have been added to Holmes County home orchards this season, according to Mrs. Bettie A. Caudle, of Bonifay.



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Because of transportation difficulties and labor shortage, we suggest the wisdom of ordering your materials well in advance of requirements

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Effect Of Certain Packing House Practices... On Decay, Rind Breakdown And Juice Quality Of Florida Oranges

Within a relatively short span of years many changes have taken place in the handling of citrus fruits in the packing house. Fruit generally receives more brushing, pomelling, and processing today than was the case some years ago. Rind injuries such as "burnt stems" and related blemishes (breakdowns which develop during the transit and marketing period but which are not immediately associated with or followed by active decay) are more prevalent now than some ten or fifteen years ago, possibly as a result of increased treatment in the packing house.

It is well known that gassing with ethylene to remove the green-color pigment from the rind of citrus renders the fruit more susceptible to stem-end rot and to certain types

By J. R. WINSTON, Senior Horticulturist, and G. LEE ROBERTS, Junior Scientific Aid, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration U. S. Dept. of Agr. At Meeting Florida State Horticultural Society.

rind breakdown and decay in Florida oranges during the marketing period, inspections were made over a two-year period when box-lot samples were taken from several points along the line in the packing house as the fruit passed from the dumping belt to the grading belt. All houses from which fruit

was obtained were equipped with soaking tanks, which were drained daily. The sampling stations were: (1) dumping belt; (2) just past the scrubbing brushes; (3) after color-adding, or after drying if not color-added; and (4) after waxing and polishing, that is, at the "foot" of the grading belt before the fruit reached the graders. Thus each collection consisted of four crates of approximately 200 fruits each. Fourteen collections, consisting only of the principal varieties such as Parson Brown, Hamlin, Pineapple, and seedling, were made from late October through December. The fruit had received the ethylene or the color-added treatment or both. Samples were collected in Lee County, along the east coast, and

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TABLE 1. Relation of some packing house treatments to rind breakdown and decay in Florida oranges.

Color Treatment	Collected	1 week at 50°						
		Sound %	Rind Breakdown		Mech. Inj. %	All rots %	SER %	Pen. %
			Slt. /1 %	Tot. %				
Ethylene and/or color-added	From dumping belt	90.4	4.7	4.9	3.2	1.6	0.4	1.2
	After washing	89.2	7.2	7.4	2.6	0.8	0.3	0.5
	Before polishing	84.4	10.5	11.1	3.9	0.5	0.4	0.1
	From grading belt	81.8	13.4	14.0	3.8	0.3	0.1	0.2
No ethylene or color-added	From dumping belt	93.2	5.2	5.3	1.2	0.3	0	0.3
	After washing	90.8	7.4	7.4	1.5	0.3	0	0.3
	Before polishing	87.5	11.3	11.3	0.8	0.3	0	0.3
	From grading belt	86.1	11.3	11.4	1.6	0.9	0.4	0.5

of rind injury; it is not uncommon also to see fruit so badly bruised, if not crushed, as it is dumped from the field crates onto the dumping belt. Many believe that the punishment to which fruit is subjected during the washing and polishing process predisposes it to rapid spoilage; yet few if any concrete data have been published clarifying these points. Hence a preliminary survey was made and the results are reported herein.

Material and Methods

In order to determine to what extent the usual washing, color-adding, and waxing treatments may contribute to the development of

+ 1 week at 70°

Sound %	Rind Breakdown		Mech. Inj. %	All rots %	SER %	Pen. %
	Slt. /1 %	Tot. %				
65.4	10.2	12.0	1.4	21.2	10.5	10.7
56.4	13.6	17.3	1.5	24.8	13.0	11.8
56.7	21.3	26.7	2.5	14.2	7.7	6.5
57.5	22.9	28.4	2.5	11.5	6.7	4.8
66.0	12.5	17.0	0.6	16.5	9.0	7.5
59.9	17.6	21.3	0.7	18.1	9.1	9.0
55.3	22.4	27.7	0.5	16.4	10.4	6.0
55.7	19.1	26.4	0.8	17.1	9.8	7.3

1/ Slight—total affected area not larger than a dime.

“By Their Fruits Ye Shall Know Them”

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A. G. SCOTT
General Manager

E. J. PARKER
Production Manager



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Heavy, Even, Luxuriant Foliage Indicate Healthy Trees

The picture reproduced at the left was taken one week after the storm which played so much havoc with groves a few months ago. The photograph shows the splendid condition of the grove and graphically illustrates the value of the heavy, even, luxuriant foliage as a protection to the trees, while at the same time giving evidence of the sturdy and healthful condition of the trees . . . only can trees produce their best crops when such a healthy condition exists.

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EFFECT OF CERTAIN PACKING HOUSE PRACTICES ON DECAY, RIND BREAKDOWN AND JUICE QUALITY OF FLORIDA ORANGES.

(Continued from page 10)

in the central and north central Florida districts.

From the same districts eight samplings were made of non-gassed, non-color-added Pineapple and Valencia oranges, from February to April, inclusive.

The gassed fruit was in the ethylene room 12 to 74 hours, averaging 46 hours; temperatures varied from 80 to 90°, mostly around 85°. The length of time the fruit was in the color-added bath ranged from two to five minutes, averaging three minutes; the temperature of the bath ranged from 114° to 128°, averaging 125°. The color-added fruit was brushed from less than one minute to more than four-and-one-half minutes, averaging slightly over two minutes, while the non-color-added fruit was on the brushes from one minute to almost four minutes, averaging slightly more than two-and-one-half minutes.

The samples were brought to the U. S. Department of Agriculture laboratory at Orlando, stored for one week at 50° (to simulate transit temperatures), inspected, transferred to a 70° holding room, and held there for a week (to simulate the marketing period), then reinspected.

Results

Table 1 gives the results of the first and second inspections. First consider that part of the table dealing with oranges which received the color-enhancing treatment, harvested for the most part before Christmas. The data show that after one week at 50°, the highest percentage of sound fruit (90.4%) was found in the samples taken from the dumping belt, and the least number of sound (81.8%) in the lots taken from the grading belt. Rind breakdown was least prevalent (9.4%) in samples from the dumping belt, and most abundant (14.0%) in samples from the grading belt. There was thus a progressive increase in rind breakdown as the fruit passed through the machinery. The percentage of mechanical injuries (cuts and bad bruises) was not greatly increased by processing. Although very little decay developed during the storage period at 50°, there was five times as much in the samples from the dumping belt as in samples from the grading belt. The reduc-

tion was progressive, which probably is significant.

The reinspection after holding these samples for a week at 70° showed a sharp reduction of 25 to 30% in the number of sound fruit, accompanied by a corresponding increase in rind breakdown and decay. 65.4% sound fruit remained in the samples from the dumping belt and 57.5% in lots taken from the grading belt. Again with each progressive step in processing, rind breakdown increased, from 12.0% on the dumping belt to 28.4% on the grading belt. The rate of decay was greatest in the samples taken from the dumping belt and least in the samples from the grading belt, viz. 21.2% and 11.5% respectively. The types of rots were rather equally divided between stem-end rot and Penicillium, or "blue mold."

In the case of the fruit which received neither ethylene nor added color, harvested from February into April, the highest percentage of sound fruit (93.2%) was found in lots from the dumping belt, and the least (86.1%) in lots from the grading belt, after one week at 50° F. Rind breakdown increased

progressively from 5.3% to 11.4% as the fruit passed through the machinery. Again mechanical injuries were neither abundant (less than 2%) nor increased by processing, and again the amount of decay was rather slight, less than 1%, at the end of the first week.

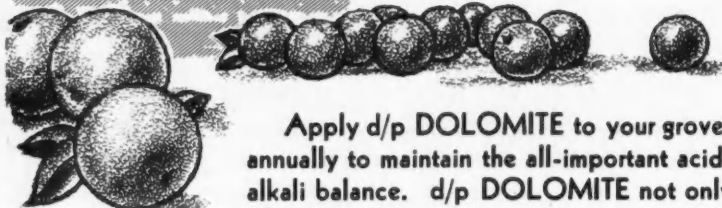
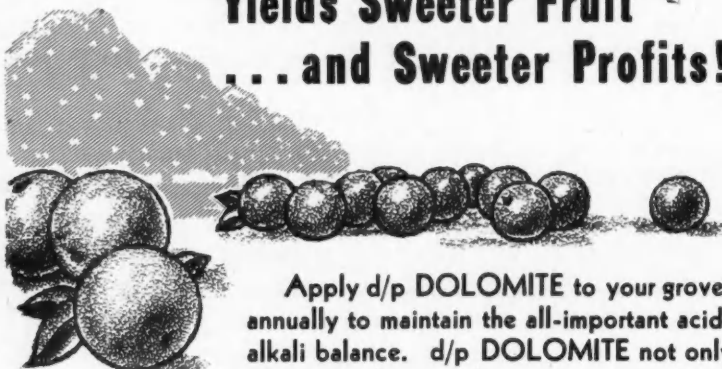
During the second week there was a 25 to 30% decrease in sound fruit. There were 66.0% sound fruit in the unwashed samples, and 55.7% in the samples receiving the full treatment, with a 12-15% increase in both rind breakdown and decay during this second week. 17% rind breakdown appeared in samples from the dumping belt and 26.4% in those from the grading belt.

Decay was not increased by the washing or polishing process. As in the colored fruit, the type of decay was rather equally divided between stem-end rot and blue-mold.

Although detailed data on the analyses and taste tests are not presented in tabular form, the analysis of the juice and taste tests made on sound fruit at the end of the holding period indicated that the washing, color-adding, and waxing treatments had little if any effect

(Continued on page 15)

DOLOMITE-Sweetened Soil Yields Sweeter Fruit ... and Sweeter Profits!



Apply d/p DOLOMITE to your groves annually to maintain the all-important acid-alkali balance. d/p DOLOMITE not only sweetens the soil by correcting excess acidity but also supplies the essential calcium and magnesium that are vital for tree health and production of high quality fruit of exceptionally good flavor. Apply d/p DOLOMITE now to sweeten your soil and your 1945 profits.



EFFECT OF CERTAIN PACKING HOUSE PRACTICES ON DECAY, RIND BREAKDOWN AND JUICE QUALITY OF FLORIDA ORANGES.

(Continued from page 14)

upon the total soluble solids, total acid, or vitamin C (ascorbic acid) content of the juice. Taste tests indicated that flavor was not improved in any case but was unmistakably impaired in some lots receiving the full treatment. The juice quality seemed in some instances to have been impaired by the waxing process, although the change could not be correlated with any type of wax or method of application. It is quite possible that the off-flavors could be attributed to application of an excessive amount of wax. It should be borne in mind that off-or stale flavors, develop in oranges after harvesting, depending upon length and temperature of the storage period, and it is quite probable that indiscreet heat or wax treatment might hasten the development of these undesirable flavors. The treatments in the houses from which samples were taken probably were not harsh enough to bring about a rapid deterioration of juice quality.

Discussion

Although no attempt was made to select conservatively operated packing houses as the source of fruit supply, it is worthy of comment that in only one instance was the temperature of the ethylene room excessive, and that the fruit from that house was the only lot which developed "wilting", a general softening of the stem region. In all instances the temperature of the color-added bath was held reasonably low (an average of 125°), so that there were no such high temperature effects as general collapse of the oil vesicles, common in former years when higher temperatures in the color-added bath were employed.

Obviously some washing is necessary to remove dirt; color treatment is needed to improve the appearance of many crops; waxing may be desirable to preserve the fresh, plump state. It is equally obvious that rind breakdown increased as processing was increased to improve appearance. What does not appear in the summary table, but what is of especial importance is that in every case where lots from the dumping belt were compared with

(Continued on page 22)



George Washington said it....

"I know of no pursuit in which more real and important service can be rendered to any country than by improving its agriculture . . ."

PRESIDENT GEORGE WASHINGTON — one of the first scientific farmers in this continent — expressed this opinion in his letter of July 10, 1794, to John Sinclair.

ON his own plantation, Washington had improved agriculture by spreading manure extensively and by replacing the prevailing one-crop system with multi-crop production.

THUS, Washington accomplished to a limited extent what successful Florida farmers of today achieve to a much greater degree with Gulf Fertilizers — the building up of the soil so that it will raise larger, higher quality crops.

WE of the Gulf Organization are proud that we are in a pursuit which, in Washington's words, renders important service to its country by improving agriculture. During wartime when food is the backbone of a nation and its army, we are especially pleased that Gulf Fertilizers — keyed to Florida soils — and trained Gulf Field Men make it possible for Florida farmers to raise a record crop from every row.

For Everything that
Grows in Florida... Use



GULF

Brands of

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The Gulf Fertilizer Company
Tampa and Port Everglades, Florida




The LYONIZER

Department

COMPILED BY THE LYONS FERTILIZER CO.

Reports Of Our Field Men . . .

SOUTHWEST FLORIDA

F. W. (Felton) Scott

Citrus trees throughout this area are putting on a very fine bloom and growth, and with favorable weather conditions we can reasonably expect a fine crop of fruit for the coming year. Practically all of the early oranges as well as the grapefruit have been moved from this area and now we are starting to move Valencias. Vegetable growers in the Ruskin area are well under way with their spring planting, and indications at this time are that the total crop will be considerably curtailed when compared with last year, and this is especially true in the case of the tomato acreage. Prices have been very good on celery, escarole and cauliflower. However, the cabbage market has been very weak with a considerable volume of this crop on the market. Our rains have not been too plentiful and both vegetable and citrus growers are busy irrigating. The gladioli crop has been very good and producers have received good prices for their flowers.

POLK COUNTY

J. M. (Jim) Sample

Most growers in this section have completed their spring topdresser application and have had this worked into the soil. Also the general practice of using a dormant spray has been completed and this copper spray was supplemented with adequate amounts of zinc to take care of the requirements of the trees. Most growers will come back with a post bloom copper spray in April to control melanose on the new crop of fruit. There is very little tonnage of midseason fruit left on the tree and grapefruit has been moved from this section practically 100 percent. Valencias are now being moved to the market. The southeast side of most of our citrus trees were badly damaged by the hurricane in the fall and even though we are getting quite a bit of growth on this wood at the present time it is doubtful if very much of this will set as this part of the tree will not have vitality to set

the bloom. We could use a good rain at the present time to assist in setting of our new crop of fruit. While it is not unusually dry a number of growers have started their irrigation pumps.

WEST CENTRAL FLORIDA

E. A. (Mac) McCartney

As previously reported this territory was very fortunate in having so little damage from the hurricane last fall and as a result growers throughout the section have had a very successful fruit season. We have had good prices for all varieties of fruit and are expecting this condition to continue through the Valencia season. We have just about completed our spring application of fertilizer and this has been worked into the soil. We are getting a nice bloom on most citrus trees and with their condition so good we are expecting to have a nice set of fruit for the coming season. Considerable spraying has been done this spring and with very few exceptions a complete spray program will be followed through during the summer. The berry crop is looking good and quite heavy shipments are being made from the Plant City area. Other vegetable crops are coming along nicely, but we had some damage from the frost during the middle of January.

NORTH CENTRAL FLORIDA

V. E. (Val) Bourland

There is still a considerable tonnage of midseason oranges to be moved from this section, but practically all grapefruit has been moved. In a few instances we have been picking the Valencia crop. There has been quite a bit of activity among the on-the-tree fruit buyers and a large number of Valencia crops have been sold. It now appears that our summer application of fertilizer will be somewhat earlier this year than in the past. Many growers are planning to get started with their summer fertilization during the early part of April. Spray machines have been very busy and will remain that way until after the oil spray during the early summer. Vegetable

crops in the Winter Garden area are in fine shape and some crops are now being moved to the market. The Zellwood section has an increased acreage this year and here too the crops are in excellent condition. The cold during January did considerable damage to the melon crop and in many cases the crop had to be replanted.

HILLSBOROUGH AND PINELLAS COUNTIES

C. S. (Charlie) Little

Taking this territory as a whole, we are glad to report that citrus trees have made a very fine comeback after the beating they took from the hurricane during the early fall. We are getting a nice bloom on all varieties of fruit and it appears that we will have a nice crop of fruit for the coming year. The south end of Pinellas county has suffered more than other sections of this territory and the crop will not be heavy in this section during the coming year. This particular section suffered from the drought last summer, then came the hurricane and salt water spray along with more dry weather. The cold and heavy frosts during the winter damaged some fruit in low sections and this is now showing up more than was at first anticipated. The fruit prices have been good and a large percentage of the crop that is sold on the tree has been tied up. There is still a number of grapefruit crops to be marketed and it appears that this fruit will bring very good prices. We have finished our topdresser application and in most cases groves have been given a dormant copper zinc spray.



UNCLE
BILL
Says

"I'll be seein' you next month."

Five Acres Of Tangerines Produce \$9750 . . .

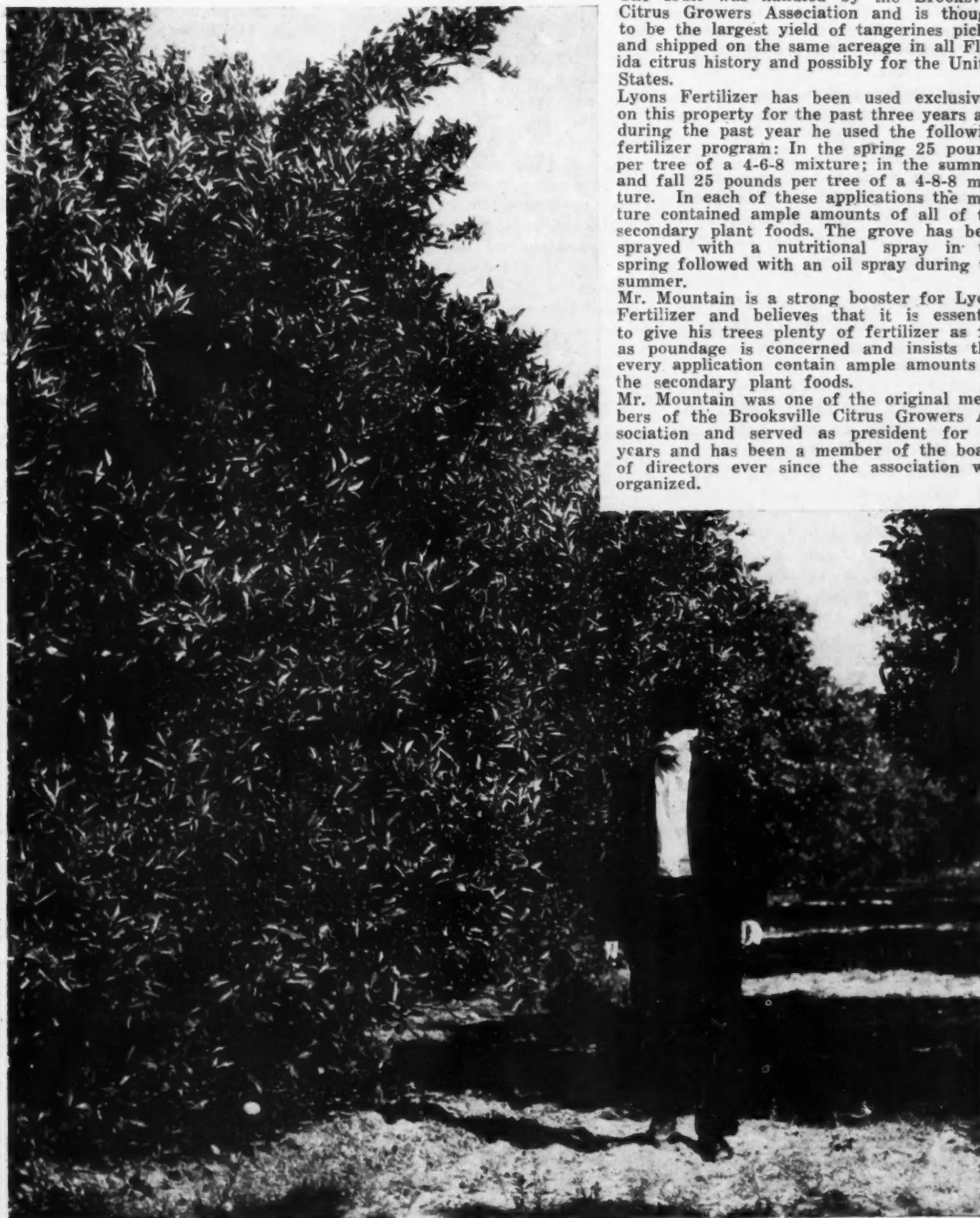
Mr. James A. Mountain one of the pioneer growers of the Brooksville section has made a remarkable record as a fruit grower over a period of years and this year on a block of tangerines he set a new all time record. On five acres of tangerines, 350 trees, Mr. Mountain picked 3000 boxes of fruit that returned \$3.25 per box or a total of \$9750 from the five acres.

The fruit was handled by the Brooksville Citrus Growers Association and is thought to be the largest yield of tangerines picked and shipped on the same acreage in all Florida citrus history and possibly for the United States.

Lyons Fertilizer has been used exclusively on this property for the past three years and during the past year he used the following fertilizer program: In the spring 25 pounds per tree of a 4-6-8 mixture; in the summer and fall 25 pounds per tree of a 4-8-8 mixture. In each of these applications the mixture contained ample amounts of all of the secondary plant foods. The grove has been sprayed with a nutritional spray in the spring followed with an oil spray during the summer.

Mr. Mountain is a strong booster for Lyons Fertilizer and believes that it is essential to give his trees plenty of fertilizer as far as poundage is concerned and insists that every application contain ample amounts of the secondary plant foods.

Mr. Mountain was one of the original members of the Brooksville Citrus Growers Association and served as president for 15 years and has been a member of the board of directors ever since the association was organized.



Sources Of Magnesium

While the necessity of Magnesium as a plant food has been known for nearly a century, it was not used as a plant food in fertilizer to any great extent until 1930 to 1933. Prior to that time a number of materials containing a high percentage of Magnesium were used in the regular manufacture of fertilizer but without any particular recognition of the benefits which could be derived from this Magnesium content.

Foreign Sulphate of Potash Magnesia containing about 8 percent of Magnesium equivalent to Magnesium Oxide and combined as Magnesium Sulphate, was rather generally used as a source of Potash. Old style Kainite containing about 6 percent Magnesium equivalent to Magnesium Oxide, and combined as Magnesium Chloride was generally used also as a source of Potash. Dolomitic Limestone was coming into more extensive use for direct application, replacing high Calcium Limestone, but almost entirely from the standpoint only of raising the pH value of the soil, or, "sweetening" the soil as it was generally called, and with very little, if any, recognition of the value of Magnesium content. Hardwood Ashes containing from 2 percent to 5 percent Magnesium Oxide were in general use for direct application but entirely as a source of Potash and for "sweetening" the soil. The use of the above listed materials together with many others containing minor amounts of Magnesium was of great benefit in correcting and preventing Magnesium deficiencies, but because the purpose of the Magnesium was not generally understood the results obtained were haphazard.

Within a few years following 1930, Magnesium began to come into general recognition as a direct and important plant food and Magnesium bearing materials began to be used from the standpoint of the Magnesium content. About the first of these materials was Dolomitic Limestone, imported from Tennessee until about 1934, at which time production started in Florida. Within a short time this Florida production supplied all the needs in the state. Dolomitic Limestone contains an average of 35 percent Magnesium Carbonate and 55 percent Calcium Carbonate. The Magnesium Carbonate is water insoluble but is slowly

BY HOWARD THULLBERY

At Meeting Florida State Horticultural Society

broken down by the action of soil acids. It is generally considered that about one year is required before considerable quantities of Magnesium from Dolomitic Limestone will reach the plant in the available form. Within a short period after 1930 small amounts of Epsom Salts came into use for supplying an immediate available source of Magnesium. Epsom Salts contains about 17 percent Magnesium equivalent to Magnesium Oxide, and combined as Magnesium Sulphate, which is readily water soluble and therefore almost immediately available to the plant. A few years later a material called Emjeo was introduced in Florida and rapidly came into general use as a source of water soluble Magnesium. Emjeo is a Calcined Kierserite, Kierserite being a natural Epsom Salts of rather high purity.

The Emjeo as received contained about 30 percent Magnesium equivalent to Magnesium Oxide and combined as Magnesium Sulphate. Emjeo and any of the Magnesium Sulphates could be used to any extent desired in the manufacture of mixed fertilizers.

The above is a brief history of the use of Magnesium materials up until the beginning of the war. During this time the quantities of these materials used increased rapidly every year. Emjeo, however, being a material imported from a foreign country, was immediately cut off when war was declared.

Seawater Magnesium Oxide

About 1939 a new source of Magnesium called Seawater Magnesium Oxide was introduced in Florida. Seawater Magnesium Oxide is an actual Magnesium Oxide containing 90 percent and higher, Magnesium equivalent to Magnesium Oxide. As the name indicates, it is a finely divided Magnesium Oxide which is recovered from evaporation and processing of sea water in California.



REG. IN FLA.

"The Modern Copper Fungicide"

- It gives maximum efficiency at low cost.
- It does not cause abnormal scale infestations.
- It fits into normal spray combinations.
- It is easily handled and disperses rapidly in the spray tank.

COPOFILM is naturally fine. (It is not a ground product.) Its 1200 per inch particle size and its 34% metallic copper content are properly balanced. This makes the material go farther and give better scab and melanose control Florida citrus growers have recognized the outstanding quality of COPOFILM.

JACKSON GRAIN COMPANY
TAMPA - FLORIDA

For Valuable Premiums Save the Coupons Packed in Copofilm

It is water insoluble as it stands but reacts rapidly with acid materials and particularly with organic acid in the soil, to become water soluble. Because it is an Oxide, it is extremely alkaline, and when used in quantity can raise pH very rapidly, being much more effective in this regard than Dolomite because it is highly reactive due to its chemical composition and its fine state of division. If applied as a separate material to the soil, or after dry mixing in a fertilizer with which it will not react, it must react with Organic acids in the soil to become soluble, and where the soil is dry or short of acid materials this reaction may be very slow.

It would be desirable, where possible, to base it with Phosphate and Nitrogen solution to make a more water soluble material, but the limitations in this regard are rather strict, because an excessive amount will raise the pH of the mixture so high as to cause a loss of Ammonia Nitrogen. The same applies to its use in dry mixes or other fertilizer mixtures; that is to say, the amount that can be used in mixtures is limited to the amount that will not raise the acidity of the mixture high enough to release the Ammonia Nitrogen if this is used. In most fertilizer mixtures two to three units may be used with safety or more can be used if Ammonical Nitrogen from Sulphate of Ammonia or Nitrogen Solution is eliminated. This characteristic limits its use in fertilizer mixtures, particularly where large amounts of Sulphate of Ammonia must be used. This must be closely watched because an excessive amount is likely to result in considerable loss in Ammonia Nitrogen so that a shortage will show up in the control analysis. As a substitute for a strictly water soluble Magnesium such as Emjeo, it is probably not as highly available or as reactive as that material and should be used at a somewhat higher level of availability figure than given by the company making up the mixture. Where it is a dry mix there is probably some reaction before it reaches the grove, but in many mixtures this reaction will not be marked, and most of the water soluble Magnesium developed from Magnesium Oxide will have to be developed in the soil.

In the later part of 1942, the Government took over the entire production of Seawater Magnesium Oxide. This material came back on the market again in May 1943.

Calcined Magnesite

Immediately following this action a Magnesium material called Calcined Magnesite came into the market and was generally used as replacing Seawater Magnesium Oxide. Calcined Magnesite is produced by roasting Magnesite, a Magnesium Carbonate, producing Magnesium Oxide. This material is the same chemical compound as Seawater Magnesium Oxide but of somewhat lower analysis, usually averaging about 85 percent Magnesium equivalent to Magnesium Oxide. Its use was, of course, parallel to the use of Seawater Magnesium Oxide in all respects. In the early part of 1943

the Government took over also the output of this Calcined Magnesite. Since that time other Calcined Magnesites have been put on the market.

Magnesium Oxide

Immediately following this action another similar material came on the market by the name of Magnesium Oxide. This material is essentially the same as Seawater Magnesium Oxide and Calcined Magnesite.

Sulphate of Potash-Magnesium or Sul-Po-Mag

In the meantime as a very fortunate circumstance to supplement these Oxides which as explained,

Two Essential Requirements Govern Proper Fertilization

FIRST --

The Fertilizer must be a well balanced mixture tuned to each customer's particular needs and containing the essential vital elements.

SECOND --

The Fertilizer must be available at the proper time in order to perform its job with maximum efficiency.

Our fifteen years of service in the heart of Florida's citrus belt has proven to hundreds of growers the unvarying quality of Florida Favorite "FFF" Brands, while even with wartime restrictions our truck delivery service from factory to grove still remains unexcelled.

Our Field Service Men will be glad to tell you more of the "FFF" method of developing maximum production.

Florida  **Favorite**
FERTILIZER COMPANY

Old Tampa Road

Lakeland, Florida

could be used to a limited extent only in mixed fertilizers, Sulphate of Potash-Magnesia, which had been imported from foreign countries and which had disappeared from general use in the fertilizer industry, came back into the markets from domestic production under the name of Sul-Po-Mag.

Florida consumption grew from 500 tons in 1933-40 to 5500 tons in 1940-41; 18,000 tons in 1941-42 to 25,000 tons in 1942-43. Here rationing began, otherwise probably 30,000 tons would have been used in the State. In the 1943-44 season close to 30,000 tons will be available. The reason more Sul-Po-Mag is not available is due to the fact that the Government built a \$16,000,000 plant for the conversion of Magnesium Chloride (a by-product of Sulphate Potash) to Metallic Magnesium for airplane production. The production will be about the same in 1944-45 as in 1943-44. Due to shortage of Muriate of Potash, quite a tonnage was used in other states the past season for its Potash content. With a larger amount of Muriate of Potash available the coming season, this may release more of the Sul-Po-Mag for Florida where it is used for its Magnesium content as well. The increased production of Sul-Po-Mag has given a fair replacement of the former use of Emjco or Magnesium Sulphate, as all the Magnesium is in the water soluble form. The material carries 18½ percent of Magnesium equivalent to Magnesium Oxide and 21½ percent Potash. It is of good mechanical condition. It is particularly desirable for Alkaline soils because it does not raise the pH and would be used in preference to the Magnesium Oxides in overlimed groves, coastal groves with a high pH, and where a quick reaction is desired. The only limitation on its use in Florida at the present time is the supply, as it can be mixed in practically any type of mixture including top dressers and used whenever soluble magnesium is desired.

Actomag

Another material used to a limited degree in the State was Actomag and is what is known as a selectively Calcined Dolomitic Limestone. As a result of this selective calcining the Magnesium Carbonate in the Dolomitic Limestone is converted to Magnesium Oxide and the Calcium Carbonate remains as Calcium Carbonate. The resulting product contains about 27 percent Magnesium equivalent to Magnesium Ox-

ide and about 65 percent Calcium equivalent to Calcium Carbonate. Under general Florida conditions the Calcium Carbonate in this material is not considered to have any appreciable value which resulted in a rather high freight charge to be applied against the Magnesium content. Since the content of Magnesium is only about half that of the usual Magnesium Oxides, about twice as many pounds were required to produce the same units of Magnesium in a mixture and this was another fact which limited the use of Actomag in Florida.

Kemidol

At a comparative recent date a product called Kemidol was introduced to the Florida market. This material is produced by Calcining Dolomitic Limestone but by complete Calcination instead of selective Calcination as in the case above. By this complete calcination a product is produced containing about 35 percent Magnesium equivalent to Magnesium Oxide and about 55 percent Calcium equivalent to Calcium Oxide and both Magnesium and Calcium are present as actual Oxides. It appears from the limited amount of work which has been done in Florida upon the use of this material in mixed fertilizers, that its use will be limited to the extent of a conditioning agent only,

which would mean about 30 pounds per ton. Both Calcium and Magnesium are present in a very alkaline and caustic form and unfavorable reactions would, therefore, be produced if more than a few pounds per ton should be used.

Brucite Fines

Another product recently introduced in the State is Brucite Fines. This is derived by calcining natural Brucite, Magnesium Hydroxide, mined in Quebec, at a controlled temperature to produce a satisfactory rate of activity. It contains 65 percent Magnesium equivalent to Magnesium Oxide. The word fines refers to the screening operation to separate the larger particle sizes more suitable for industrial uses. This gives a product in a granular form, thereby eliminat-

HOTEL PUTNAM

Fireproof

DeLAND'S FINEST
HOTEL

R. H. Brown
Owner-Manager

Cut Spraying Costs . . .

Complete Protection

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- More than 100 models assure you the EXACT Iron Age machine to spray with ease and economy.
- 7 Pump Sizes . . . the right pump for each sprayer.
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- Rugged construction means years of trouble-free operation.
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ing a great deal of the dustiness found in other forms of Magnesium Oxides which makes them quite disagreeable to use. Fertilizer manufacturers in other States report 80 to 85 percent conversion to water soluble Magnesium Oxide in mixtures under factory conditions according to State of Maine's method analysis. However, the writer knows of no work done on this product in Florida.

Dolomite

There has been less inclination in the last few years to use excessive applications of Dolomite and more of a tendency to limit applications to the amounts necessary to bring the pH back up to around 6.0 once a year, the amounts being used usually running in the neighborhood of 400 to 600 pounds per acre unless large amounts of Dolomite have been used in the fertilizer. The inclusion of Dolomite in the AAA program resulted in a much wider use of this material as a grower could receive some remuneration for Dolomite application under the AAA program. In addition to its use as a separate material it has been increasingly used as a filler and is now probably more widely used as a filler in fertilizer than any other material. In this sense it is not strictly a filler, that is, in the sense the term was originally applied to sand or similar materials which served only to bring the mixture up to 2000 pounds. Dolomite in a fertilizer has the same effect that it has in separate application, namely, to control pH and to furnish slowly available Magnesium, and in many plantings there has been a tendency toward including enough Dolomite in the fertilizer to eliminate the frequent applications of Dolomite as a separate material. Prior to the war there was considerable discussion on the possibility of using Dolomite in the base pile with Phosphate and Nitrogen solution and thus obtain soluble Magnesium through reaction in the base pile.) This was tried experimentally on a small scale but does not seem to have been followed up to any extent during the war period, and Dolomite is still generally regarded as a material for separate applications or as a filler in fertilizers and not as a substitute for readily soluble Magnesium. The chief difficulty involved in the Dolomite situation during the war period has been one of labor, and this has been so acute at times that it has been necessary to import Dolomite from other states in order to have sufficient available

to satisfy the growers' requirements. Some difficulties along this line are still to be expected during the heavy fertilizer mixing periods and growers wanting Dolomite for direct application should time these deliveries to the slack mixing periods.

Summary

It will be observed that there are three general types of Magnesium materials which have been and are in general use, as follows:

Carbonates, which are water soluble but which break down slowly

which may be used in general to any extent in compounding mixed fertilizer without producing unfavorable reaction with other materials; Oxides, water insoluble or nearly so, under reaction of soil acids and very caustic and readily combined with soil acids, applicable to limited use only in compounding mixed fertilizers because of their activity in producing unfavorable reaction with other materials; Sulphates, readily water soluble and therefore immediately available, applicable to

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High Grade TEXAS CALCINED MAGNESITE

Manufactured By J. J. Cates, Llano, Texas
Home Office, Cates Building, Sanford, Fla.

A fertilizer material rich in Magnesium for grove, nursery and farm requirements. Contains an average of 80% Magnesium as Magnesium Oxide — **immediately** active and available for improving soil pH Value, correcting Magnesium Deficiency, and building up a Magnesium reserve in the soil.

Your Fertilizer Manufacturer Will Supply TEXAS CALCINED MAGNESITE

in your favorite fertilizer brands at from 2 to 4 units for maintenance depending upon conditions, or will recommend **direct application** for correction of severe Magnesium Deficiency at a rate per acre to suit your particular condition.

"BRONZING" (Magnesium Deficiency)

of **citrus trees** and the various symptoms of Magnesium Deficiency in **vegetables** indicate serious losses in production which you cannot afford to take. The use of **Texas Calcined Magnesite** will pay big dividends in healthy trees and plant condition, increased volume of production, and improved quality of fruits and vegetables.

TEXAS CALCINED MAGNESITE

Sold By:

Lyons Fertilizer Company, Tampa, Florida
Florida Favorite Fertilizer Company, Lakeland, Florida
Haines City Fertilizer Company, Haines City, Florida
Polk County Fertilizer Company, Haines City, Florida
Maxcy Fertilizers, Inc., Frostproof, Florida
Wheeler Fertilizer Company, Oviedo, Florida
Chase & Company, Sanford, Florida
Citrus Culture Corporation, Mount Dora, Florida
Plymouth Fertilizer Works, Plymouth, Florida
Parrish Fertilizer & Manufacturing Co., Deland, Fla.
Alvin H. Hinson, Plant City, Fla.

use in compounding mixed fertilizers to any extent and under all conditions.

All three of these types of materials are needed for proper blending and manufacture of mixed fertilizers to supply Magnesium in various percentages; all three types are also needed for application in fertilizers to supply Magnesium to fit the various soil conditions and type of plants and trees. With the exception of a short period during 1942, sufficient quantities of these various types of Magnesium have been available in Florida to accomplish both of the above problems in at least a satisfactory manner. As the situation is a changing one and new materials are constantly being tried, the remarks in this paper should not be taken as final but merely the judgment at this time as to the relative usefulness and value of the various sources.

Acknowledgement is made for the assistance given by Dr. A. F. Camp and Robert P. Thornton in securing of data for this paper.

EFFECT OF CERTAIN PACKING HOUSE PRACTICES ON DECAY, RIND BREAKDOWN AND JUICE QUALITY OF FLORIDA ORANGES.

(Continued from page 15)

samples from the grading belt, it was found at the time of both the first and the second inspections that rind breakdown increased as processing was increased. This also held true in non-colored fruit. In both color-processed and non-colored fruit taken from the grading belt there was enough disfiguring rind breakdown to lessen the attractiveness of the fruit. This fact was particularly clear-cut at the time of the first inspection after one week at 50° (about the time

fruit would be reaching distant markets before enough decay had developed to mask the results). Such blemishes, even of moderate size, are frequently accompanied by off-flavors in the juice. Since clean crops require but little scrubbing, and the amount of processing necessary varies not only from grove to grove but also from month to month, a goodly percentage of rind breakdown might be reduced by lessening the amount of treatment whenever circumstances permit.

It is significant that with increase in processing, progressively less decay developed in color-treated fruit. There may be a satisfactory explanation for this: The ethylene treatment usually loosens stem buttons to such an extent that many are lost during the brushing operations incident to washing and polishing, and disbuttoned fruit is less liable to stem-end rot than fruit with stem parts adhering. In addition, the color-added compound may contain some fungicidal or fungistatic material, or the heat of the dye solution may exert some fungicidal effect. Regardless of the specific cause of the reduction in decay following the color-enhancing and brushing treatments, a reduction, nevertheless, has been noted in practically all cases when ethylene-gassed or color-added fruit from the grading belt was compared with samples from the same lots from the dumping belt, not only in the collections reported here but in others as well.

In the case of oranges that received neither the ethylene nor the color-added treatment, the rate of decay was not affected by the washing or the brushing treatment, probably due to absence of the disinfecting treatment mentioned in the paragraph above. However, it is possible that in carelessly operated houses serious damage can occur at any point between dumping belt and the grading belt.

Contrary to popular belief, in these tests there was no indication in any of the lots of fruit that infection in the soaking tank contributed to decay development. Since the amount of decay was not increased by the soaking tank, washing, dyeing, or waxing processes, it is evident that one must look elsewhere for the principal points at which damage may occur leading to infection which terminates in decay.

Summary

The washing, color-adding, ethylene and waxing treatments given

oranges in packing houses increased rind breakdown considerably. All steps appeared to contribute to the increase.

Decay of gassed or color-added fruit decreased with increased processing, while the amount of decay in fruit which was not colored was unaffected by processing.

Juice quality judged by total soluble solids, total acid, and vitamin C content was not generally affected by washing, dyeing, or lightly waxing the fruit. In a few instances flavor was definitely impaired.

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